P_T Reco from MC Comparing with Data

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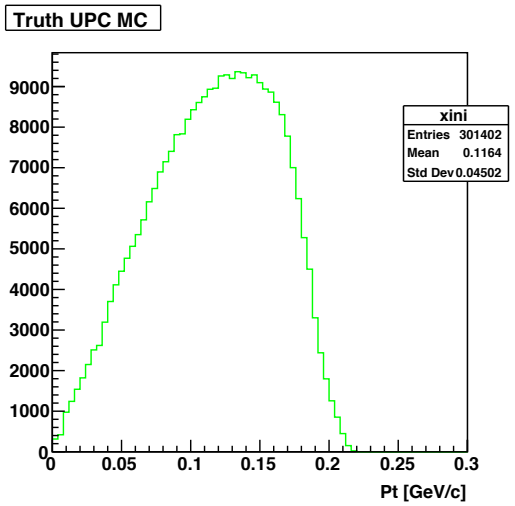
RadLab Meeting

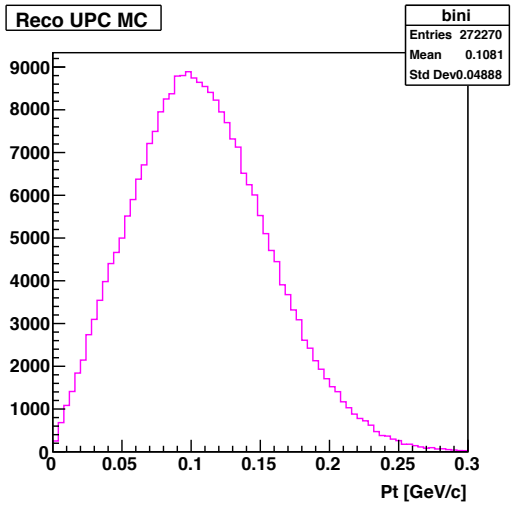
May. 22, 2019 @ 3 pm JST

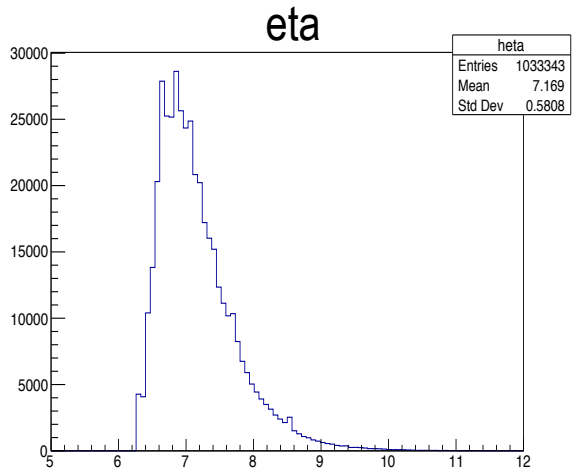
Content

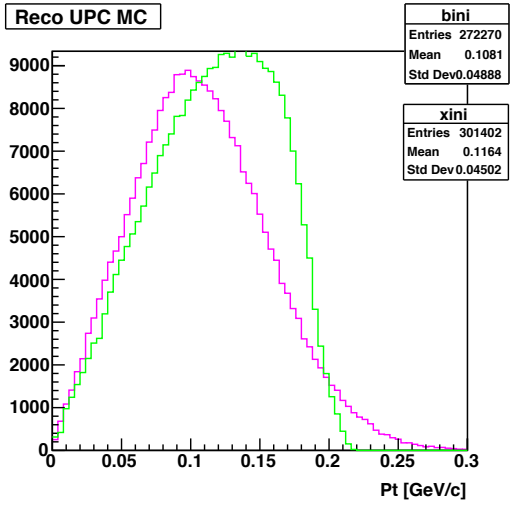
- UPC true and reco P_T – last meeting
- DPMJET true and reco P_T
- UPC + DPMJET combined true and reco P_T
- UPC + DPMJET PT comparison with data

True and Reco P_T Distributions (UPC) – Recap

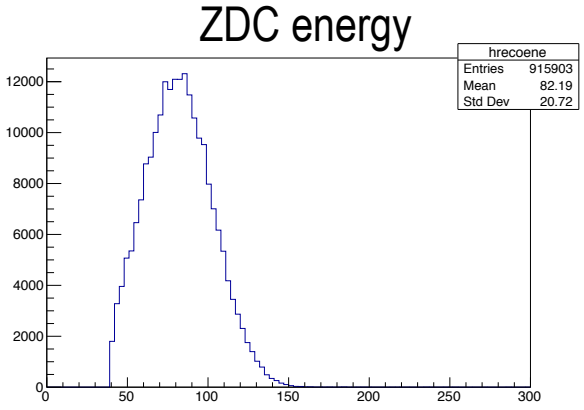








$$P_T = \frac{r}{IP} * E_r \qquad r = \sqrt{x^2 + y^2}$$



CUTS

- Eta > 6.8
- ZDC energy > 40 GeV.

True and Reco P_T Distributions (DPMJET)

PHYSICAL REVIEW C **95**, 044908 (2017)

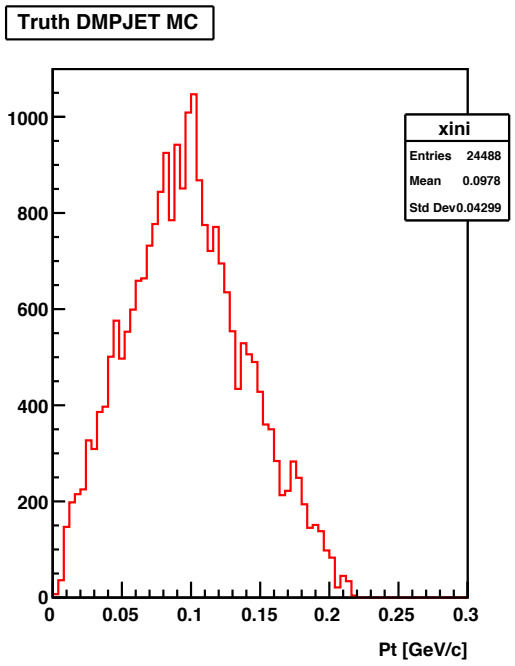
TABLE I. Cross sections for neutron production in ultraperipheral collisions and hadronic interactions at $\sqrt{s_{NN}} = 200$ GeV. Cross sections in parentheses are calculated without η and x_F limits.

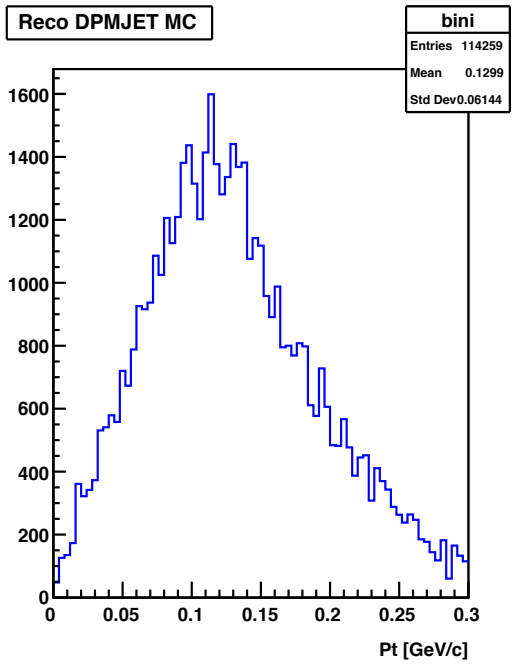
UPCs		Hadronic interactions	
$p^{\uparrow}$Al	$p^{\uparrow}$Au	$p^{\uparrow}$Al	$p^{\uparrow}$Au
0.7 mb (2.2 mb)	19.6 mb (41.7 mb)	8.3 mb	19.2 mb

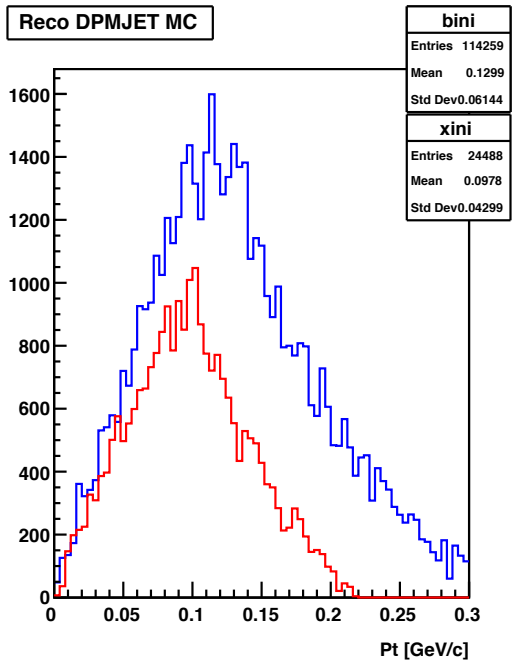
- UPC to DPMJET combination is approximately 1 : 1 ratio based on above cross sections for pAu data.
- So currently working with 915, 903 maximum available UPC events and 900,000 DPMJET events out of 1, 993, 000 maximum available DPMJET events.

True and Reco P_T Distributions (DPMJET)

Before eta = 6.8 cut

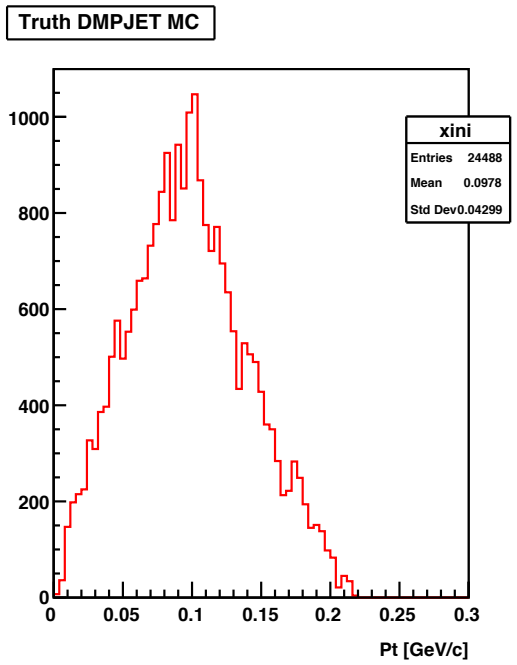


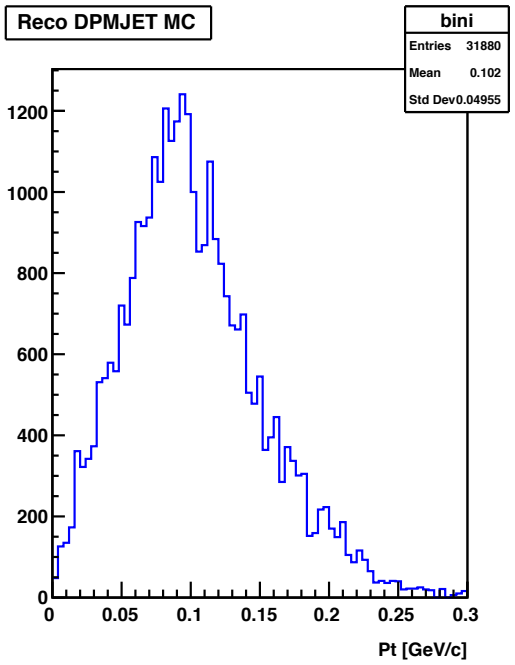


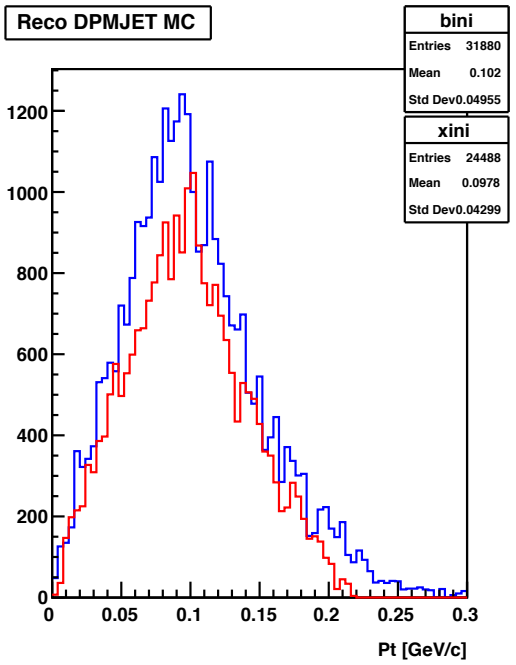


True and Reco P_T Distributions (DPMJET)

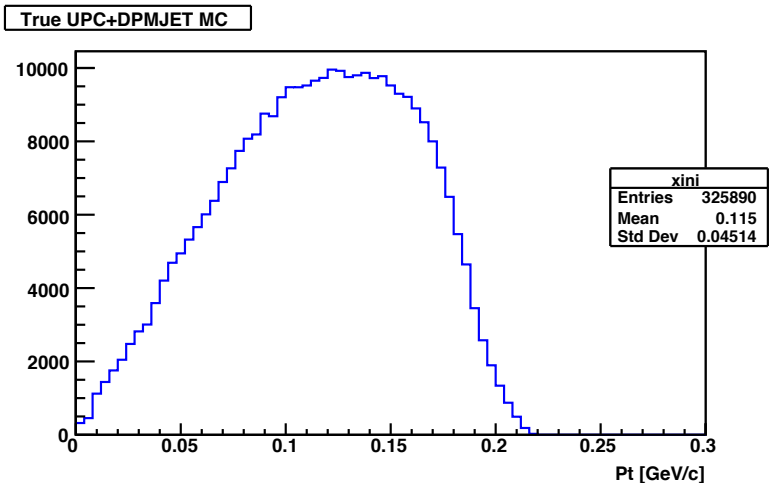
After both eta = 6.8 and energy > 40 GeV cuts

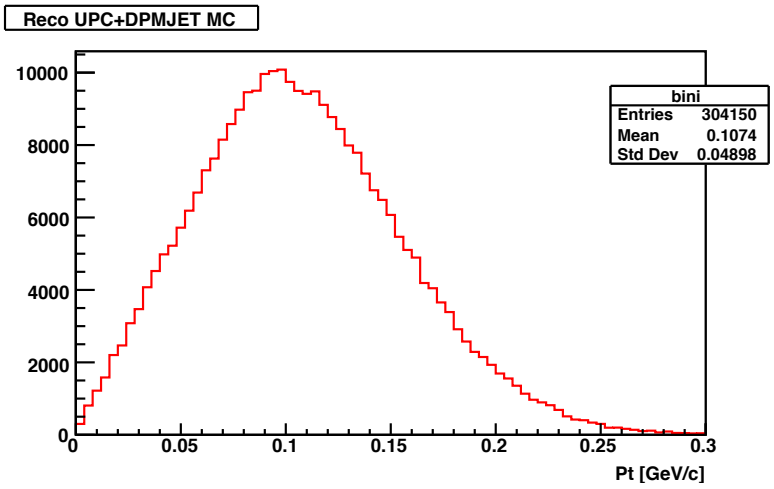


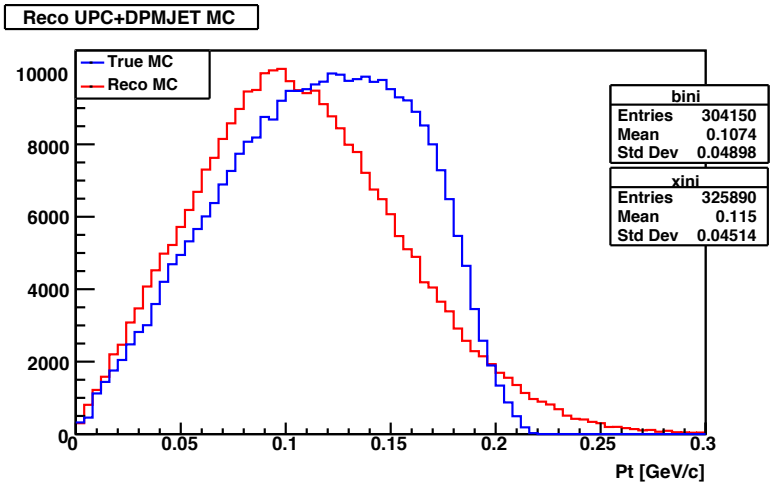


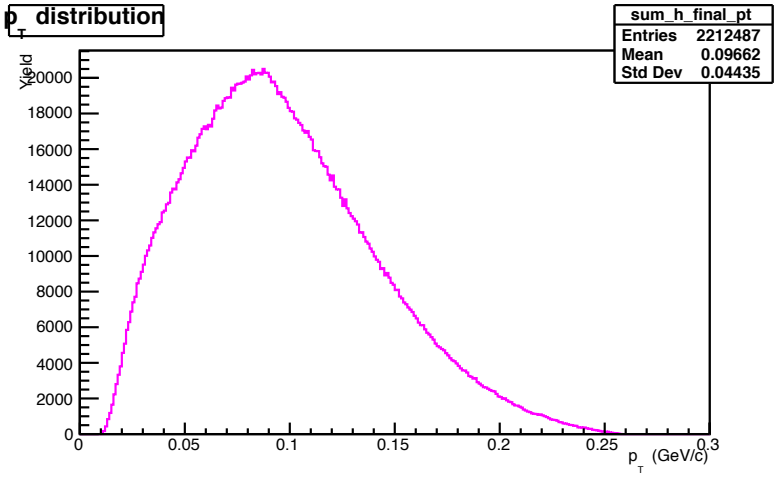


UPC + DPMJET True and Reco P_T Distributions

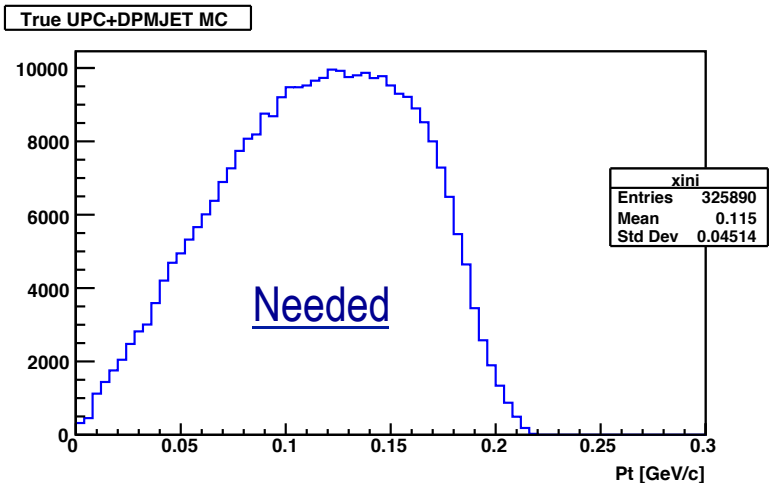


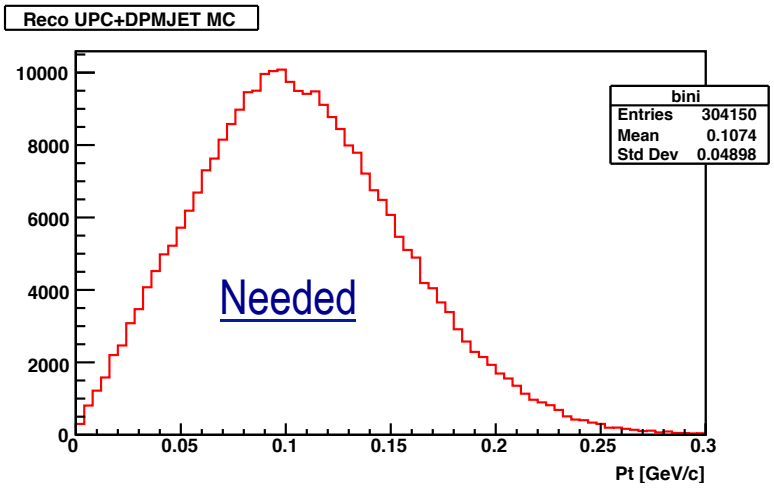




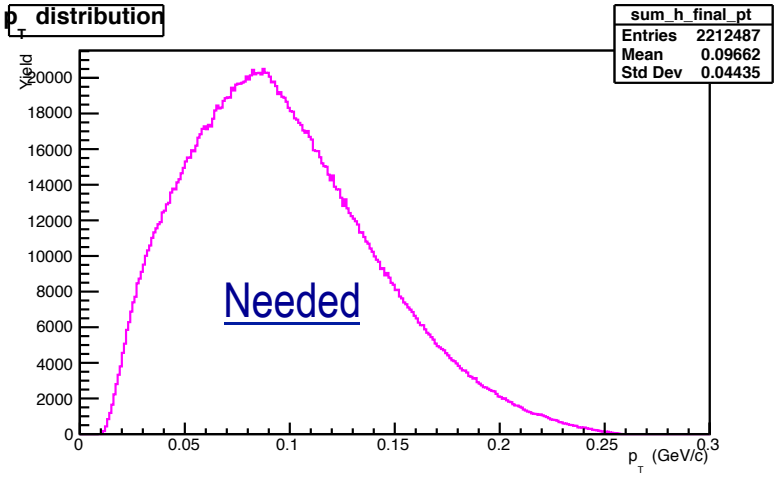


MC Inputs to Unfold Data Using TSVDUnfold

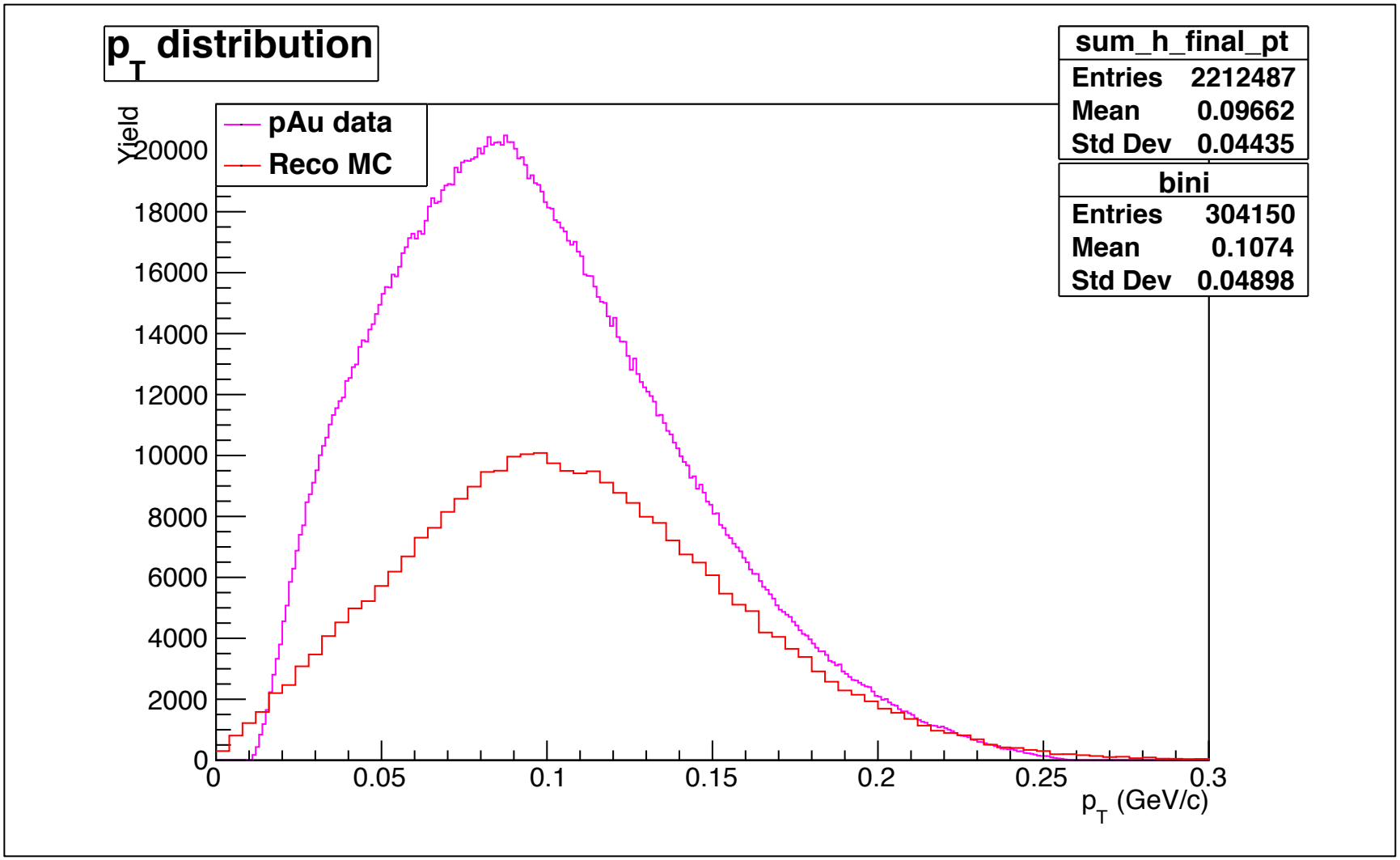




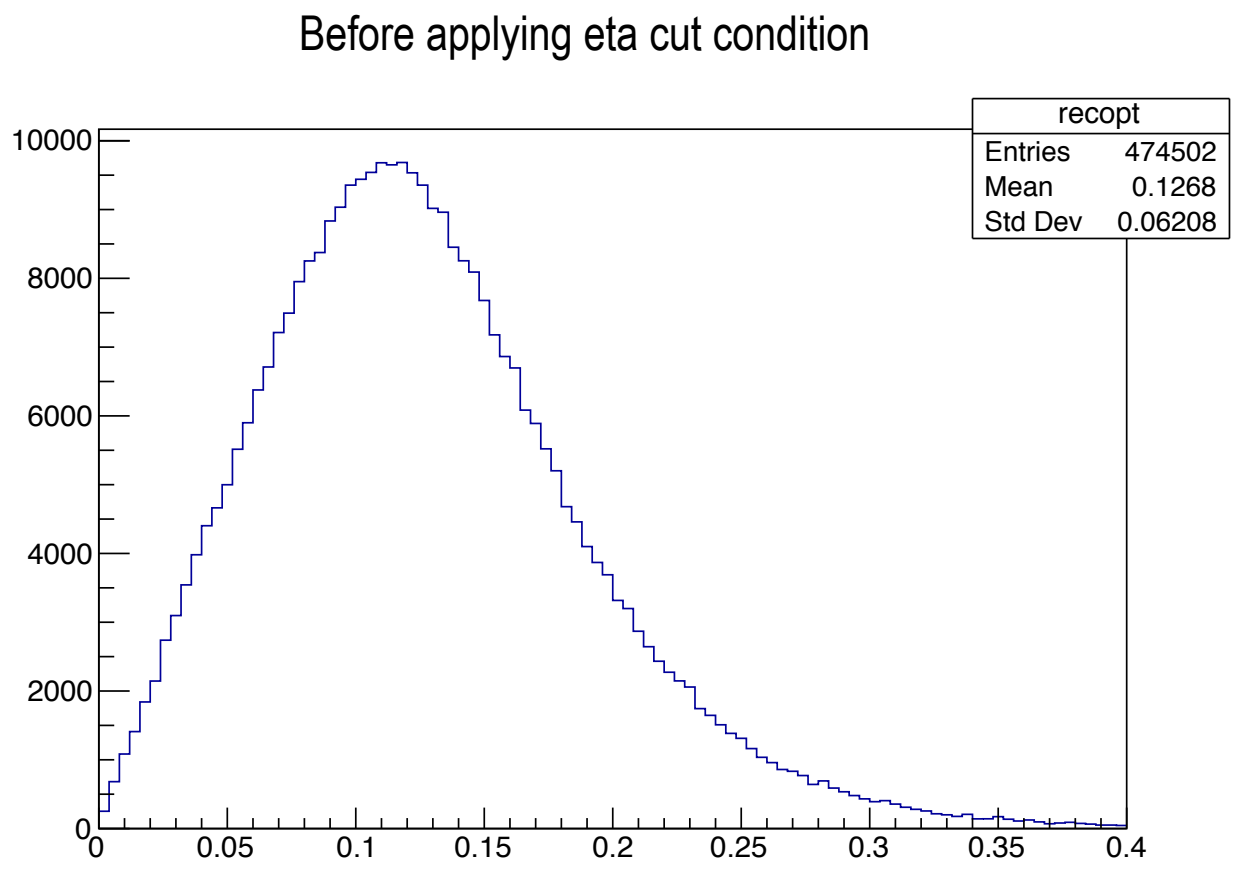
- Also need a 2D hist. of true P_T as a function of reco P_T – smeared detector response matrix.
- But before plotting response matrix – need to ensure reco P_T from UPC and DPMJET combined reproduces data.



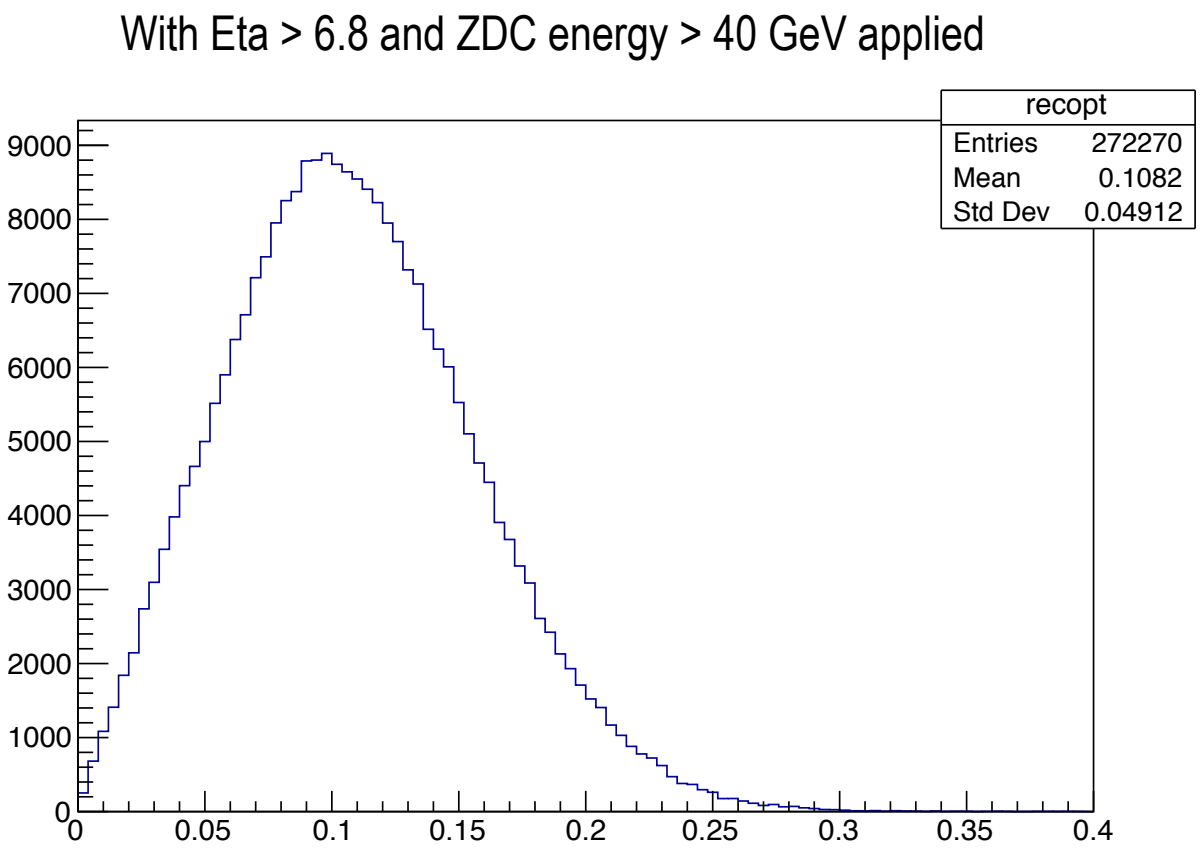
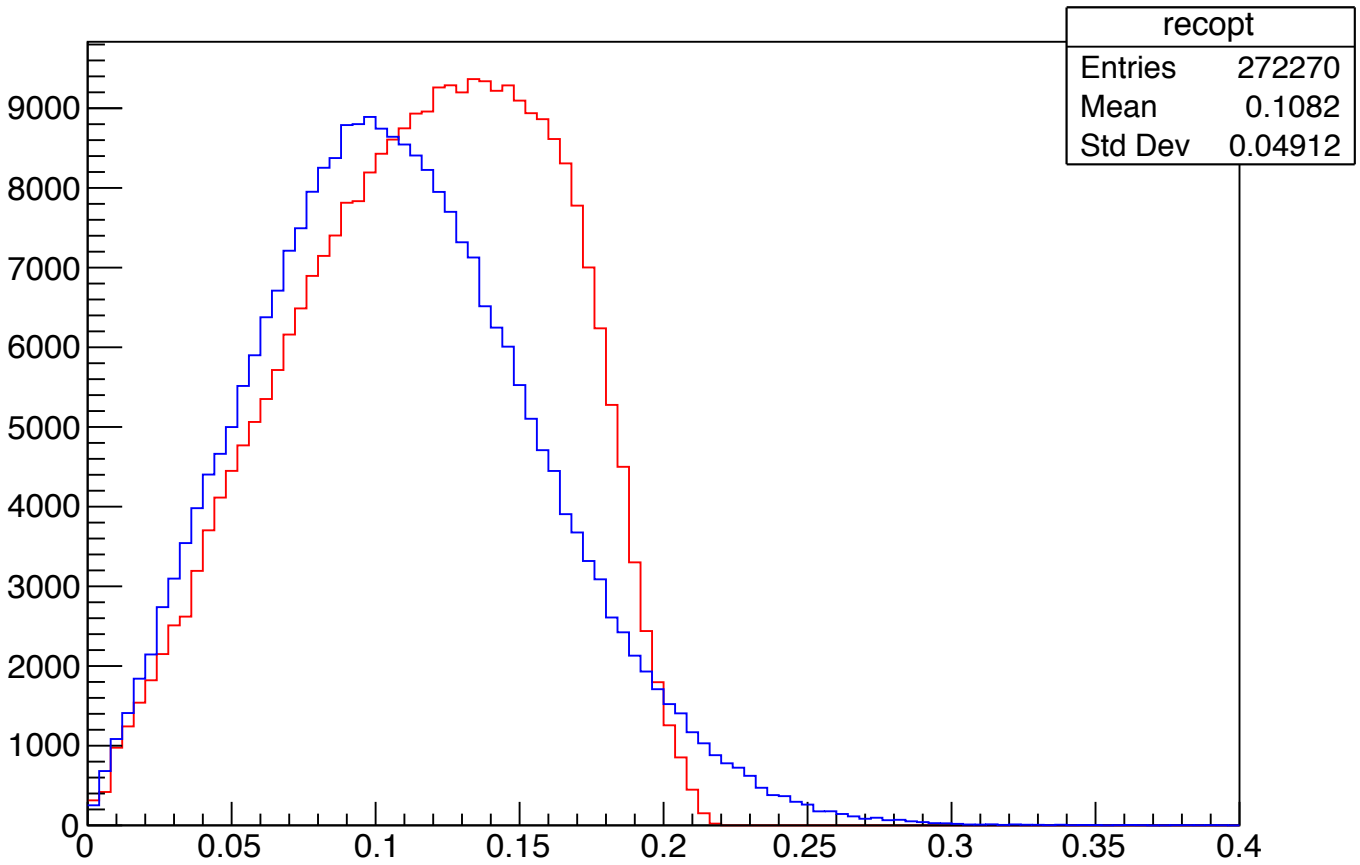
UPC + DPMJET Reco and Data P_T Comparison



Backup1: Reco P_T Distribution (UPC MC)



Backup2: Reco P_T Distribution (UPC MC)



Backup3: Reco-True P_T Comparison